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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.06/VC/WMM/Gradation/2016-17 : 09.09.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. V. Chandrappa,**
#681, Dasarahalli, Bangalore – 24.

Name of Work : Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : AEE(BS)/PR/27/2016-17 Dated: 07.09.2016

Date of Testing : 09.09.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **7900**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	265	265	3.4	96.6	95-100
22.4	2480	2745	34.7	65.3	60-80
11.2	1065	3810	48.2	51.8	40-60
4.75	1015	4825	61.1	38.9	25-40
2.36	975	5800	73.4	26.6	15-30
0.600	760	6560	83.0	17.0	8-22
0.075	955	7515	95.1	4.9	0-8

Note:

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Job No.: CTCE/BBMP/W.No.06/VC/WMM/AIV/2016-17 09.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of the Work	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	09.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	306	
4	Aggregate Impact value = percent fines	22.34	21.34	
	100* (W_2/W_1)%			21.84

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.06/VC/WMM/S-T/2016-17 09.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of Work	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	09.09.2016

Result : Flakiness Index = **11.65%**

Elongation Index = **13.84%**

Result : Combined Flakiness & Elongation index 25.49%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/146a/QB(SDBC)/2016-17 19.09.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
*NAME OF THE WORK	:	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	17.09.2016
DARE OF TESTING	:	19.09.2016

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	89	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	46	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	290	Min. 220

*Information is furnished by the Customer/Representative.

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VISHWANATH .C
Quality Manager

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/SDBC/AIV/2016-17 19.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of the Work	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	19.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	299	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.56	22.94	22.25

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/Shape_T/2016-17 : 19.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	: **Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of Work	: Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 19.09.2016

Result : Flakiness Index = **12.56%**

Elongation Index = **13.92%**

Result : Combined Flakiness & Elongation index **26.48%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/Bit/2016-17 21.09.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
NAME OF THE WORK	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
SAMPLE I/D	Roads in Shirdi Sai Nagar Ward No.06
DATE OF TESTING	21.09.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/Bit/2016-17 21.09.2016

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
NAME OF THE WORK	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
SAMPLE I/D	Roads in Shirdi Sai Nagar Ward No.06
DATE OF TESTING	21.09.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.35	5.55	5.55	94.45	90-100
4.75	262.4	55.24	60.79	39.21	35-51
2.36	55.48	11.68	72.47	27.53	24-39
1.18	37.12	7.81	80.28	19.72	15-30
0.3	34.23	7.21	87.49	12.51	9-19
0.075	36.58	7.70	95.19	4.81	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	34.25	7.23	7.23	92.77	90-100
4.75	258.4	54.51	61.74	38.26	35-51
2.36	56.47	11.91	73.65	26.35	24-39
1.18	36.23	7.64	81.30	18.70	15-30
0.3	33.12	6.99	88.28	11.72	9-19
0.075	32.85	6.93	95.22	4.78	3-8

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/AGG/2016-17 21.09.2016

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of the Work	Improvements to Roads and Drains at Shirdi Sai Nagar in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/27/2016-17 Dated: 07.09.2016
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	21.09.2016

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	365	7.0	6.95	93.05	90-100	
4.75	2645	50.4	57.33	42.67	35-51	
2.36	715	13.6	70.95	29.05	24-39	
1.18	495	9.4	80.38	19.62	15-30	
0.3	450	8.6	88.95	11.05	9-19	
0.075	365	7.0	95.90	4.10	3-8	

Total Weight of Sample: **5150** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	415	8.1	8.06	91.94	90-100	
4.75	2565	49.8	57.86	42.14	35-51	
2.36	840	16.3	74.17	25.83	24-39	
1.18	485	9.4	83.59	16.41	15-30	
0.3	245	4.8	88.35	11.65	9-19	
0.075	275	5.3	93.69	6.31	3-8	

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